



PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Safety Spring Lock

I, DANIEL GEORG MARTENS, a Norwegian Subject, of Incognitogaten 2, Oslo, Norway, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to safety spring locks and has for an object to provide for both an electrical alarm, and a mechanical blocking of the lock, so that if an effort is made to open the lock irregularly by pushing the latch inwards with a suitable implement, an acoustic or other signal will occur and yet the intruder will not be able to open the lock. The invention further permits such double security to be achieved in a simple manner and so that both the blocking and the preparation of the alarm can easily be effected and easily be annulled.

With a view to this, according to the invention a safety spring lock having an alarm-preparing position in which by inward movement of the latch from the locking position an electric alarm circuit is brought into condition for alarm, is characterised in that a blocking device which in known manner in closed position of the latch can be actuated manually for mechanical blocking of the latch, is adapted by its movement to blocking position to bring the alarm circuit into an alarm-preparing condition and in the blocking position permits the latch to be pressed inwards a limited distance sufficient to bring the circuit into alarm condition, but insufficient to permit opening of the door. By using the invention it is possible to effect alarm-preparation and mechanical blocking in one operation, and it is also possible, if desired, to annul both in one operation, and above all it is obtained that when an effort is made to open the door irregularly by pressing the latch inwards, a signal is given while the door is still locked.

A lasting signal will of course be obtained without further measures if relays are used, irrespective of whether they are connected for open circuit or closed circuit operation, and according to the invention even if open circuit operation is used with the alarm contacts directly connected in the signalling circuit, a

lasting signal can be obtained if the blocking device is adapted on inward pushing of the latch in the blocking position to block the latch in both directions in an intermediate position, in which the electric circuit is in alarm condition. In locks of the type having a blocking member movable transversely to the latch slide this can be carried out in that manner that the blocking member by its movement to blocking position loads a resilient stopping member, which in the intermediate position of the latch snaps in on the rear side of the blocking member while at the same time a fixed surface of the slide engages the front side of the latter.

In locks using a pivoted actuating member, which by an additional rotation from its closing position actuates a transversely movable blocking member co-operating with the latch slide, a simple manner in carrying out the invention consists in that the said blocking member is provided with a contact member, which in the blocking position in co-operation with a stationary contact member prepares the alarm circuit, whereas on inward pushing of the latch a contact member provided on the latch slide and a stationary contact member co-operating therewith brings the electric circuit into the condition of alarm.

If in this case, as it is usual, two actuating members are used which can both co-operate with the latch slide, but which are operated from either side of the door by turning a knob or key respectively, it may be convenient in many cases to let only one actuating member be adapted, when moved in the opening direction in the alarm-preparing condition of the lock, to cause annulling of the alarm-preparation, so that an effort to open the lock with the other actuating member when the lock is in the alarm-preparing position, will cause alarm.

A practical manner of carrying out this feature consists in that an entraining member, which is integral with the blocking member and can be actuated in known manner for moving the blocking member out of the blocking position, is provided within the operating range of only the first mentioned actuating member.

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Hereby an annulation of the blocking and of the alarm can be effected from one side of the door only, which is desirable in many cases. If for example it is the question of a lock for which many persons have a key, or if it is desired to prevent persons from getting in by means of a stolen key, it can be desirable to make safe that nobody can get in from outside or try to unlock the door without causing alarm. On the other hand it often happens that the door has a mail slot, a glass pane or other opening, so that intruders can get access to the lock through the door from outside with the hand, a sling or other implement, so that it is desirable that the annulation of the blocking and of the alarm-preparation can only be effected with a key.

In order that the invention may easily be carried into effect, it will now be described in more detail, reference being had to the accompanying drawings which illustrate a convenient embodiment of the lock according to the invention, and in which:

Fig. 1 shows the lock in horizontal longitudinal section.

Fig. 2 is an inside view of the lock housing with bottom plate and latch slide removed.

Fig. 3 is an inside view of the lock with the bottom plate removed, but indicating contact members attached to the latter.

Figs. 4 to 6 are views corresponding to Fig. 3 of the latch slide and parts co-operating therewith in blocking position, in an intermediate position in which a signal is given and in open position respectively.

Figs. 7 and 8 show the blocking device in connection with a modified embodiment and arrangement of one of the actuating arms.

Referring to the drawing 1 is the lock case which is attached to the inner side of the door in usual manner and is closed at the inside by a bottom plate 2, attached by a screw to a central inwardly projecting stud 3 within the lock case. The latch 4 is formed at the front end of a slide 5 having a longitudinal central opening 6. 7 is the lock spring which is placed in the opening 6 and at its rear end engages the stud 3. The latch slide 5 has at its rear extremity an extension forming a flange 8, which can be actuated from its front side for opening the lock by means of an actuating arm 9 which can be turned by means of the knob 10, or alternately by means of an actuating arm 9' which is shaped symmetrically to the arm 9 and is pivoted coaxially thereto in the bottom plate 2 and can be operated by means of a cylinder lock from outside the door.

A blocking member 11 is mounted for displacement transversely to the latch slide 5 and is guided in a reinforcing plate 12 on the inner side of the lock case 1. At one end the member 11 has an inwardly projecting lug 14 which is engaged by the flange 8 in the locking position so as to limit the outward movement of the latch slide, and which is so high that it can

be engaged by both of the arms 9 and 9'. The same is also the case with a square stopping stud 15, which projects inwards from the member 11 through the opening 6 at a distance behind the stud 3. A small plunger 16 which is mounted displaceably on the inside of the lock case and actuated by a helical spring 17, is provided for co-operating with notches in the side edge of the member 11 so as to arrest the blocking member in inoperative position (Figs. 2, 3 and 6) or operative position (Figs. 4 and 5). A displacement of the blocking member from inoperative to blocking position is effected by swinging the arm 9 or 9' anti-clockwise as viewed in Figs. 2 to 6, the arm in that case engaging the stud 15, whereas the displacement back to inoperative position is effected by swinging one arm or the other in the opposite direction, which arm in that case engages the lug 14.

The opening 6 has at its rear extremity an extension 18 into which the stud 15 is moved when the blocking member is moved to operative position in the locked position of the door (Fig. 4), but the length of which is considerably greater than the width of the stud. Further ahead the opening has a second extension 19, into which the stud 15 can be moved for blocking the latch when the lock is open (Fig. 6). Further the slide 5 carries a resilient stop 20 in the form of a plate spring carrying an inwardly projecting pin which can be pushed back by the stud 15 when the member 11 is moved to blocking position in closed position of the lock, but which on a slight inward pushing of the latch slide from this position (Fig. 4) to an intermediate position (Fig. 5) snaps in on the rear side of the stud 15 whereby the latch slide is blocked against movement in both directions.

For the supply of electric current a pair of terminals 21 and 22 are mounted in the bottom plate 2 and insulated therefrom, which terminals form inwardly projecting pins in the lock case and can be connected to an electric alarm circuit outside the bottom plate. In the embodiment shown in Figs. 3 to 6 a closed circuit is assumed and the terminals 21 and 22 are in that case connected to opposite poles of the electric alarm circuit. The terminal 21 carries a plate spring 25 projecting in front of the lug 14, so that in inoperative position of the member 11 the latter is out of contact with the plate spring, but on movement of the blocking member to blocking position will contact the spring, as shown in Figs. 3 and 6 and Figs. 4 and 5 respectively. The terminal 22 is placed in the path of a plate spring 30, conductively connected to the latch slide 5 and so placed that it is out of contact with the terminal 22 in entirely closed and entirely open position of the lock as shown in Figs. 4 and 6 respectively, but contacts the terminal in the above mentioned intermediate position (Fig. 5), whereby the terminal 22 is conductively con-

nected to the lock case and hence to the lug 14. Thus the operation will be as follows:—

When the member 11 is in inoperative position the lock behaves as a usual spring lock, the latch 4 being normally urged to its forward position by the spring 7, but being free to be withdrawn by clockwise rotation either of the arm 9 by means of the knob 10 from inside the door, or by the arm 9' by means of the key from outside the door. In its inward position the latch can be blocked by turning either arm anti-clockwise for causing engagement of the stud 15 with the notch 19, and the blocking can be annulled by displacement in the opposite direction in known manner. During outward and inward movements of the latch in the inoperative position of the member 11 a temporary closing contact will occur at 22, 30, but no signal will be caused, since the contact 25, 14 is open. Neither will a signal be caused by a blocking in withdrawn position, since, though a closing contact is formed at 25, 14, in this case the contact 22, 30 is open. When the lock is blocked in the closed position so that it adopts the blocked position as shown in Fig. 4, likewise the contact 25, 14 is closed, but the contact 22, 30 is open, so that still there will be no signal, and since the blocking can again be annulled from inside or outside by means of the knob 10 or the key respectively during the initial opening movement, even in this case no signal will occur as long as the lock is used regularly. However, if an irregular effort is made to push the latch 4 inwards, the latter will be blocked in the position shown in Fig. 5, in which it is still impossible to open the door, but in which the spring 30 contacts the terminal 22 while the contact 25, 14 is closed, whereby the circuit will be closed through the lock and an alarm signal will occur.

If it is desired that an annulment of the blocking and of the alarm-preparation shall only be possible from inside, one can arrange that the key-operated actuating arm 9' is unable to engage the lug 14 for moving the blocking member 11 out of the blocking position. The simplest way of obtaining this is to make the lug 14 somewhat lower than shown in Fig. 1, so that it does not project into the path of the arm 9', but still can engage the spring 25 and can be engaged by the arm 9. If it is desired that in spite of this it shall be possible to cause blocking and alarm-preparation by using the key, which may usually be desirable, the blocking stud 15 may still have the full height shown, so that it can be engaged by both actuating arms 9 and 9'.

If it is desired that a blocking and an alarm-preparation shall be possible only by using the key and not by turning the knob 10, a modified actuating arrangement may be used, which is shown in Figs. 7 and 8, in which the blocking member and both actuating arms are shown, whereas the latch slide, apart from the flange

8, has been omitted for the sake of clearness. Here the actuating arm 9'' connected to the knob is placed on that side of the blocking stud 15 towards which the blocking member moves when approaching the blocking position, that 70 is on the side opposite to that of the key-operated actuating arm 9', which is arranged in the manner previously described. The arm 9'' can when turned anti-clockwise be used for withdrawing the latch in the usual manner 75 in unblocked position, but is cut off at the rear so that, as shown in Fig. 8, it is unable to move the member 11 out of the blocking position and hence annul the alarm-preparation. Likewise it will be seen that by turning the knob it is not possible to block the lock and prepare the alarm. This may be desirable in order to prevent for example children from causing unintentional alarm by turning the knob. If in an embodiment like that described 85 it is desired to permit the lock to be blocked from inside in open and in closed position, the member 11 may be provided with a separate knob extending through a slot in the lock case in the usual manner. In that case one is not 90 safe against an unlocking of the door when it is possible to have access to the lock from outside by hand, but one is still safe against unlocking by means of a sling.

An embodiment corresponding to that 95 shown in Figs. 7 and 8 can of course also be used when it is desired that it shall be possible to make the safety device inoperative from inside only, and not from outside, by interchanging the actuating arms. Likewise it is 100 possible to make both actuating arms have a shape as shown at 9'' and when mounting the lock to place one arm ahead of the stud 15 and the other behind it or *vice versa* according to what is desired.

Another manner of ensuring that an alarm-preparation can only be annulled from one side of the lock may consist in that instead of forming the contact member of the blocking device directly on the member 11, a separate 110 displaceable bar is used, which is entrained by the movement of the blocking member to the blocking position and thereby prepares the alarm, but can be moved back by one of the actuating arms only. 115

In the case when the lock contacts are normally closed the arrangement can be the same as when the lock contacts are normally open in all the possible embodiments referred to, except that instead of two series-connected 120 contacts 25, 14 and 22, 30 two parallel-connected contacts are used, which are opened by the blocking movement and by inward pushing of the latch respectively. For example one may connect one pole of the electric circuit to 125 the metal of the lock case and connect the other pole to both terminals 21 and 22 and arrange the contact springs in the manner indicated in Fig. 8. The contact spring 25' which is carried by the terminal 21, projects behind the lug 14 130

instead of in front of it, so that an interruption occurs on moving the member 11 from inoperative position to blocking position, whereas the contact spring 30¹, which is conductively attached to the latch slide, forms a close contact with the terminal 22 in the normal locking position, whereas the contact is opened in the intermediate position. Thus, as long as the lock has not been blocked the circuit will constantly be closed at 14, 25¹, but when the member 11 is moved into blocking position in closed position of the lock, this contact will be opened, so that on a subsequent inward pushing of the latch an opening of the circuit will occur when the contact 22, 30¹ is opened, whereby an alarm will occur.

What I claim is:—

1. A safety spring lock having an alarm-preparing position in which an electric alarm circuit is brought into alarm condition on inward movement of the latch from a locking position, characterised in that a blocking device, which, as it is known *per se*, in the locking position of the latch can be actuated by hand for mechanical blocking of the lock, is adapted by its movement to the blocking position to bring the alarm circuit into an alarm-preparing condition, and in the blocking position permits inward pushing of the latch a limited distance sufficient to bring the circuit into alarm condition, but insufficient to permit opening of the door.

2. A safety spring lock according to claim 1, characterised in that the blocking device is adapted on inward pushing of the latch in the blocked position to block the latch in both directions in an intermediate position in which the circuit is in the condition of alarm.

3. A safety spring lock as claimed in claim 2, having a blocking member movable transversely to the latch slide, characterised in that

the blocking member by its movement to the blocking position loads a resilient stopping member mounted on the latch slide, which stopping member in the intermediate position of the latch snaps in on the rear side of the blocking member while at the same time a fixed surface of the slide engages the front side of the blocking member.

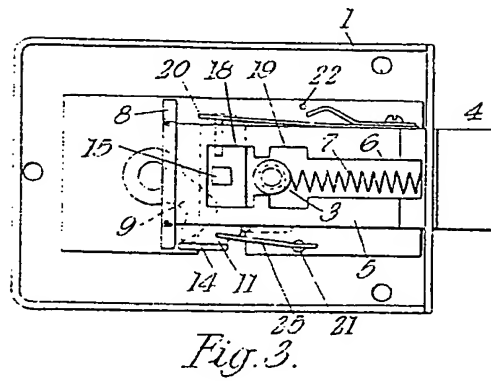
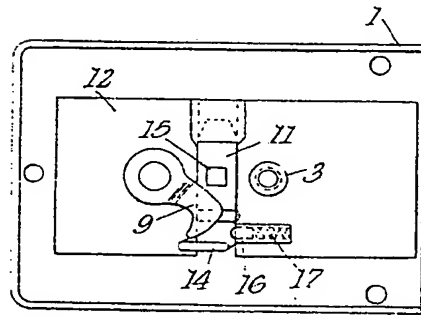
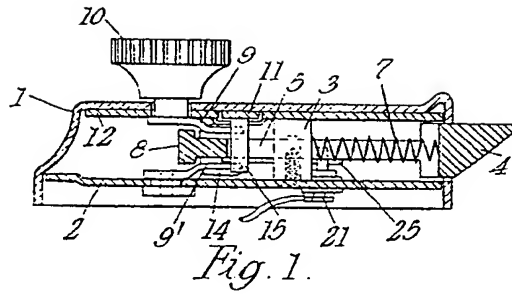
4. A safety spring lock according to any of the claims 1 to 3, having a rotatable actuating member which by an additional rotation from closed position actuates a transversely movable blocking member co-operating with the latch slide, characterised in that the said blocking member is provided with a contact member which in the blocking position in co-operation with a stationary contact member prepares the alarm circuit, whereas a contact member provided on the latch slide and a stationary contact member co-operating therewith brings the circuit into alarm condition on inward pushing of the latch.

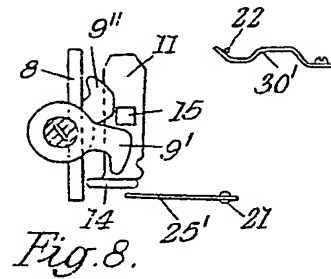
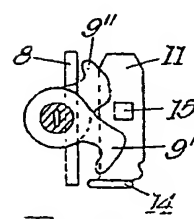
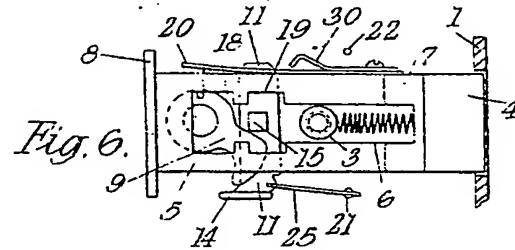
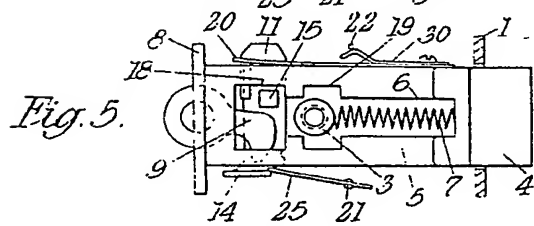
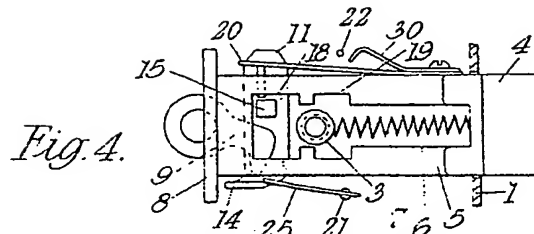
5. A safety spring lock according to claim 4, having two actuating members operated from either side of the door and co-operating with the latch slide, characterised in that only one actuating member is adapted by a movement in the opening direction in the alarm-preparing position of the lock to cause annulment of the alarm-preparation, so that an effort to open the lock with the other actuating member when the lock is in alarm-preparing position, will cause alarm.

6. A safety spring lock according to claim 5, characterised in that an entraining member formed on the blocking member and adapted to be engaged for moving the blocking member out of the blocking position in known manner, is arranged within the range of movement of the first mentioned actuating member only.

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736439 COMPLETE SPECIFICATION
2 SHEETS
This drawing is a reproduction of
the Original in a reduced scale.
SHEETS 1 & 2

